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December 15, 2010

The Honorable Manuel Flores
Acting Chairman
Illinois Commerce Commission
160 North LaSalle Street
Suite C-800
Chicago, Illinois 60101

The Honorable Erin O'Connell-Diaz
Commissioner
Illinois Commerce Commission
160 North LaSalle Street
Suite C-800
Chicago, Illinois 60101

Dear Acting Chairman Flores and Commissioner O'Connell-Diaz,

Ameren Illinois appreciates the opportunity to comment on the impact Plug-in Electric Vehicles (PEV) may have on the electric distribution system. Ameren Illinois believes one of the keys to the success of the PEV market and all of the energy benefits it can provide is connected to the electric utility's ability to continue to provide safe and reliable power. Customers will expect utilities to be able to provide service sufficient to adequately charge their vehicles. Likewise, utilities recognize that PEV's represent the potential for a significant load on the delivery system. The PEV market will take time to develop in the Ameren Illinois service area. While PEV's will not be available outside of targeted launch cities until late 2011 or early 2012, Ameren Illinois does expect to see some PEV's in its territory at that time. In the mean time, we are preparing for what we believe could be a transformation in the auto industry.

In March 2010, Ameren created a team to explore the potential impacts and opportunities that the development of the PEV industry may introduce to our business and customers. The PEV Team includes subject matter experts from Ameren Illinois, Ameren Missouri, Ameren Services, and Ameren Energy Fuels & Services. The PEV Team has researched a variety of issues, such as penetration rates of PEVs in Ameren's service territory, the impacts on our distribution system, and potential rate structures that would encourage off-peak charging of vehicles. Many of the findings from the cross-functional PEV team are contained in the Ameren Illinois initial assessment.

The response to the Initial Assessment is separated into two sections. The first section discusses the early action items regarding 1) Distribution system impacts; 2) Rate options; 3) Public charging infrastructure deployment; and 4) Clear adequate information to obtain necessary utility service and third-party equipment for in-home/business charging. The second section provides responses to the eleven subject areas contained in your September 13, 2010 letter.

Ameren Illinois is looking forward to participating in the PEV collaborative effort. If you have any questions regarding this initial assessment, please call Jackie Voiles or me.

Sincerely,

D. Scott Wiseman

D. Scott Wiseman, Vice President
Regulatory Affairs

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Section 1: Early Action Items

The "Guidelines for Initial Assessment" requested a discussion of early (e.g., next two years) action items on the following topics: 1) Distribution system impacts; 2) Rate options; 3) Public charging infrastructure deployment; and 4) Clear adequate information to obtain necessary utility service and third-party equipment for in-home/business charging. These items are somewhat interconnected.

Distribution System Impacts

In general, Ameren Illinois believes the PEV market will develop gradually over the next several years. PEV availability is expected to be restricted until manufacturing production rates increase. The initial release of PEV's is targeted to major metropolitan areas and to states other than Illinois. Once PEV's become available, the existing backbone distribution system is capable of reliably serving demand.

The immediate delivery system concern is ensuring that line transformers can adequately serve a customer's increased load. PEV ownership could be clustered in residential pockets. If this occurs, serving multiple PEV customers from the same line transformer could exceed the capability of the existing transformer, even if customers charge vehicles during off-peak hours. Reliability could be affected. We will encourage customers to contact us prior to connecting their PEV at home so that a service adequacy assessment may be performed.

Ameren Illinois plans to reach out to auto manufactures and dealerships to seek their assistance in having customers contact us at the point of sale of the automobile. We feel it is in the auto manufacturers' (and dealership) best interest to ensure the customer has reliable power continuing after the point of sale of a PEV. In any event, Ameren Illinois will be proactive in taking the necessary steps to replace and upgrade overloaded equipment as necessary.

Rate Options

We will encourage customers to consider charging PEV's during off-peak times. Shifting incremental usage to off-peak periods will allow greater use of existing resources by limiting additional investment in the distribution system, which in turn will minimize costs to help keep rates lower for all customers. Off-peak charging may also directly benefit the customer financially through lower charging costs. Off-peak rates are cheaper than on-peak rates. Rate options available to PEV owners will direct customers to consider existing real-time pricing ("RTP") programs. Ameren Illinois recognizes that not all customers will accept RTP as an option, and some customers, especially some who heat their homes using electricity, may at least at the current time, find the standard fixed price rate more financially advantageous.

Ameren Illinois is also sensitive to its role as an Integrated Distribution Company ("IDC"). As an IDC, the promotion, marketing, or advertising with regard to the provision of electric supply service is prohibited. Directly marketing or promoting RTP service, or any other favorable off-peak rate, to PEV customers may require a waiver from the ICC.

Ameren Illinois is committed to facilitating customer power supply choice in its service area. Retail Electric Suppliers ("RES") may choose to also offer time-variant power prices to customers. Implementing such an offer would likely require use of an interval meter since a standard load profile would not reflect the incremental off-peak use. Ameren Illinois stands ready to work with RESs to determine how to best encourage off-peak rates.

Public Charging Infrastructure Deployment

Public infrastructure deployment may serve to reduce public fears of being left stranded away from home, also known as range anxiety. The added "safety net" may encourage longer driving excursions, especially for customers with electric-only vehicles, even if the public does not regularly use the public charging stations. Most PEV charging, at least initially, is likely to be performed at home. Some employers, municipalities, or businesses may choose to build charging stations as well. The Ameren Illinois role may be to act as an advisor to the customer - share experiences learned from operating its own PEV's and best practices garnered from talking to vendors, trade organizations, and other customers. In this light, Ameren Illinois will stand ready to work with local municipalities and businesses to support public and private PEV charging, in addition to providing distribution service to the customer (i.e., a customer offering a charging service), as it would any other incremental customer.

Clear Adequate Information to Obtain Necessary Utility Service and Third-party Equipment for In-home/Business Charging

Communication is key to a successful development of the PEV market. We envision a symbiotic relationship between the automobile dealer, customer, utility, and local public or private charging provider. At the point of purchase of the PEV, Ameren Illinois expects that the auto dealer will share with the customer a brochure strongly encouraging the customer to contact Ameren Illinois. Ameren Illinois will in turn check the customer's premise for adequate service (i.e., transformer, service line, etc…) and notify the customer of availability of RTP or some other appropriate tariff that encourages customers to charge vehicles during off-peak times. Ameren Illinois will also encourage customers to work with licensed electricians for the installation of "Level 2" charging stations. Such stations require 208/220/240 volt connections, and may not be readily available in locations where customers may access their vehicles without some amount of extra work.

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Section 2: Subject Area Details

This next section addresses specific subject areas provided in the "guidelines for initial assessment".

1. **A discussion of the Commission's jurisdiction and role over the development of electric vehicle charging infrastructure and the provision of electric vehicle charging services, including a discussion of the legal status of the entities that offer such services;**

Commission's Jurisdiction and Role

Please note that the question of the extent of the Commission's jurisdiction over all matters touching and concerning the development of PEVs is a broad subject. Below, Ameren Illinois provides only a general overview with initial impressions of the subject matter.

The Commission today helps ensure the provision of adequate, efficient, safe, reliable, and equitable service. Those roles will no doubt continue, and warrant evaluation under the paradigm of a developing PEV market. Regardless of the legal particulars of the Commission's jurisdiction over PEV and PEV related activities, Ameren Illinois expects the Commission will remain an active and involved participant in the development of PEV as the electric delivery systems of the utilities subject to its authority are the sole providers of the infrastructure that enable PEV technology. It should go without saying that the emergence of PEV technology does not appear to alter the Commission's jurisdiction concerning electric public utilities in Illinois.

As detailed in the foregoing, the Commission likely does not have jurisdiction to assert authority over consumers, PEV manufacturers, owners and operators of charging equipment (for public or private use).

The extent of the Commission jurisdiction over the development of PEV charging infrastructure depends largely on the applicability of controlling definitions contained in the Illinois Public Utilities Act and exclusions thereto. As discussed more thoroughly below, whether charging related service is considered subject to Commission jurisdiction depends on whether a "public utility" that is also an "electric utility" provides delivery of power to retail customers in a manner that is not considered a "competitive service."

"Public utility" is defined in 220 ILCS 5/3-105 of the Act, and encompasses essentially all entities that are engaged in the production, storage, transmission and delivery of heat, light, water or power for public use. This definition is similar to what is provided for in other state laws. The definitional qualifiers of what constitutes a "public utility" control the threshold applicability of an important legal status that drives the applicability of the Act. The Act itself is the sole source of the Commission's jurisdictional authority delegated to it by the Illinois General Assembly.

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Clearly, manufacturers, vendors, and purchasers of PEVs and PEV charging systems are not engaged in the production, transmission, or distribution of power for public use, but rather are producers and consumers of the technology that utilizes the electric delivery system and the electric power such systems furnish. Additionally, as noted above, the Commission's authority over public utility distribution will no doubt remain unaltered. However, there remains the question of whether independent charging stations, public or private, would fit the definition of "public utility."

A broad application of the "public utility" definition could lead to a conclusion that a charging station is in fact a public utility. However, a logical and analytical application would not support such an interpretation. A charging station is similar to a proprietor of alkaline batteries, a gas station or a propane distributor – all purveyors of energy commodities, but none of whom are considered public utilities in Illinois. While the Commission regulates the intrastate delivery of power, gas and oil hydrocarbons, once the hydrocarbons leave the distribution system for use by consumers, the Commission, like similar regulatory agencies in other states, no longer asserts authority over the usage of the energy commodity.

The Commission traditionally has not regulated entities involved in the transference of energy for utilization in customer appliances. As energy exits a jurisdictional distribution system and is used by appliances and technological applications, the Commission's regulation ceases to apply. In this case, the PEV motor is a consumer appliance, and it follows that charging activity associated therewith is not subject to the Commission's jurisdiction. Such an activity is integral to the consumer's utilization of an energy commodity after it leaves the utility distribution system.

Further, given the enactment of the Electric Service Customer Choice and Rate Relief Law of 1997 ("1997 Restructuring Law"), the Commission's jurisdiction concerning competitive services should be noted. The production of PEV, PEV charging equipment, and related services are competitive services.

The 1997 Restructuring Law defines competitive service as follows: ""Competitive service" includes (i) any service that has been declared to be competitive pursuant to Section 16-113 of this Act, (ii) contract service, and (iii) services, other than tariffed services, that are related to, but not necessary for, the provision of electric power and energy or delivery services." Charging infrastructure arguably is related to, but not necessary for, the provision of electric power and energy delivery service. Therefore, a charging station is arguably a competitive service, and the 1997 Restructuring Law makes clear that such an activity is outside the scope of the Commission's jurisdiction.

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2. **A projection of the number, location and timing of customers adding electric vehicles to the utility's system based either on surveys of the utility's customers or other available data;**

PEV Market Penetration

There is a tremendous amount of uncertainty around forecasting market penetration of PEVs, since the technology is in the very early stages of market rollout in the U.S. The Obama Administration envisions one million plug-in hybrid vehicles on U.S. roads by 2015 (USAToday, 2010). Recent government incentives and stimulus investments designed to accelerate market acceptance, including grants and loans to manufacturers and tax credits to consumers, indicate movement toward this goal. Below is a summary of three PEV market penetration and load forecasts:

- Nationwide Forecast: KEMA, Inc. *Assessment of Plug-in Electric Vehicle Integration with ISO/RTO Systems* (March 2010)
- Nationwide Forecast: IDC Energy Insights (IDC Energy). *Business Strategy: The Coming Plug-In Electric Vehicle Rollout-Forecasting the Market* (September 2010)
- Ameren Illinois Forecast (April 2010)

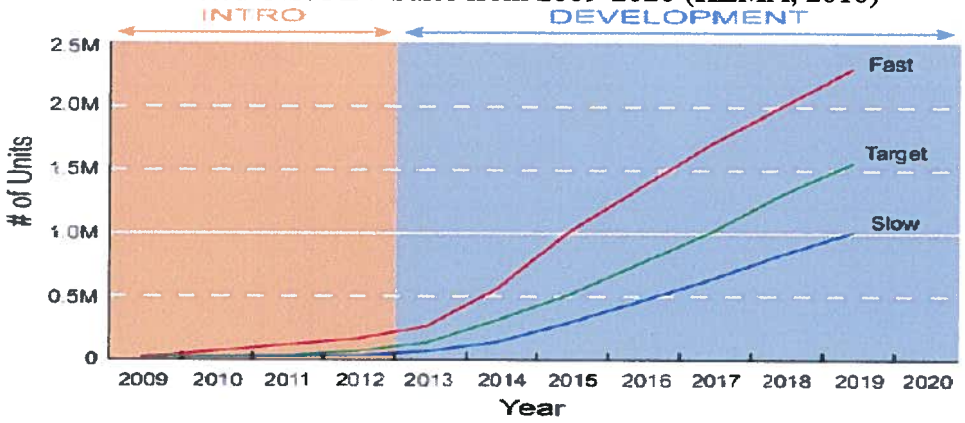
Ameren Illinois has also conducted a survey of customers to determine general awareness of PEV's.

Nationwide Forecast: KEMA, Inc.

The Independent System Operators/Regional Transmission Organizations (ISO/RTO) Council commissioned KEMA, Inc. to develop a PEV market penetration forecast. The key from the ISO/RTO perspective was to locate the concentrations of PEVs that can provide significant impact for demand response resources. The KEMA PEV market projections were based on historical Prius adoption rates. The Prius adoption rates were used to model PEV penetration rates to meet the goal of 1 million PEVs by 2015 (fast scenario), 2017 (target scenario), and 2019 (slow scenario). The KEMA projections assume a smooth transition in market growth. In addition, the KEMA projections are based on extrapolations of first-generation vehicles; however, it is important to note that "game-changers" in cost and power density can have dramatic impacts on the PEV market penetration rates. KEMA forecasted a potential range of 250,000 to one million PEVs in the U.S. by 2015. **Figure 2.1** presents forecasted U.S. PEV Sales from 2009-2020 (KEMA, 2010).

Figure 2.1

Forecasted U.S. PEV Sales from 2009-2020 (KEMA, 2010)



Assuming that historical Toyota Prius adoption rates are a good proxy for estimating regional PEV penetration, KEMA estimates that PEVs will be distributed more densely on the West Coast and Northeast than in the Midwest and Southeast, and that metropolitan areas will have higher concentrations than rural areas.

According to the KEMA analysis, Los Angeles was ranked 1st out of the top 20 most populous metropolitan areas in the U.S. in terms of PEV adoption by 2015; Chicago ranked 6th, and, St. Louis was ranked 20th. **Table 2.1** presents the projected distribution of consumer, fleet, and total PEVs in the top 20 most populous metropolitan areas to meet the goal of 1 million PEVs by 2015 (KEMA, 2010).

Table 2.1

Projected Distribution of PEVs in the
Top Twenty Most Populous Metropolitan Areas by 2015 (KEMA, 2010)

City	Consumer PEVs	Fleet PEVs	Total PEVs
New York	40,000	14,069	54,069
Los Angeles	105,000	14,069	119,069
Chicago	20,000	7,892	27,892
Washington, DC	31,000	6,520	37,520
San Francisco	85,000	6,005	91,005
Philadelphia	13,000	5,319	18,319
Boston	27,000	4,976	31,976
Detroit-Ann Arbor	6,000	4,718	10,718
Dallas-Fort Worth	6,500	4,461	10,961
Houston	8,000	4,032	12,032
Atlanta	4,500	3,517	8,017
Miami	8,000	3,346	11,346
Seattle-Tacoma	23,000	3,088	26,088
Phoenix	13,000	2,831	15,831
Minneapolis	8,000	2,574	10,574
Cleveland-Akron	6,000	2,574	8,574
San Diego	20,000	2,445	22,445
St. Louis	3,500	2,230	5,730
Denver-Boulder	9,000	2,230	11,230
Tampa-St. Pete	7,000	2,059	9,059

Note: Metro areas located within the ISO/RTO study are **bold**; other metro areas are in gray

KEMA also developed load and charging projections for these same twenty metropolitan areas. KEMA assumed that 80 to 90% of the charging would occur in the evening or at night; 10% of charging time would occur during the daytime. The study also assumed that 20% of the vehicles would be charged at Level 1 and 80% would be charged at Level 2. KEMA forecasted load projections based on the following charging scenarios: concurrent charging within one hour, staged charging over eight hours, and staged charging over twelve hours. **Table 2.2** presents the load and charging projections for the top 20 most populous metropolitan areas (KEMA, 2010).

Table 2.2

Load and Charging Projections for the Top Twenty Most Populous Metropolitan Areas (KEMA, 2010)

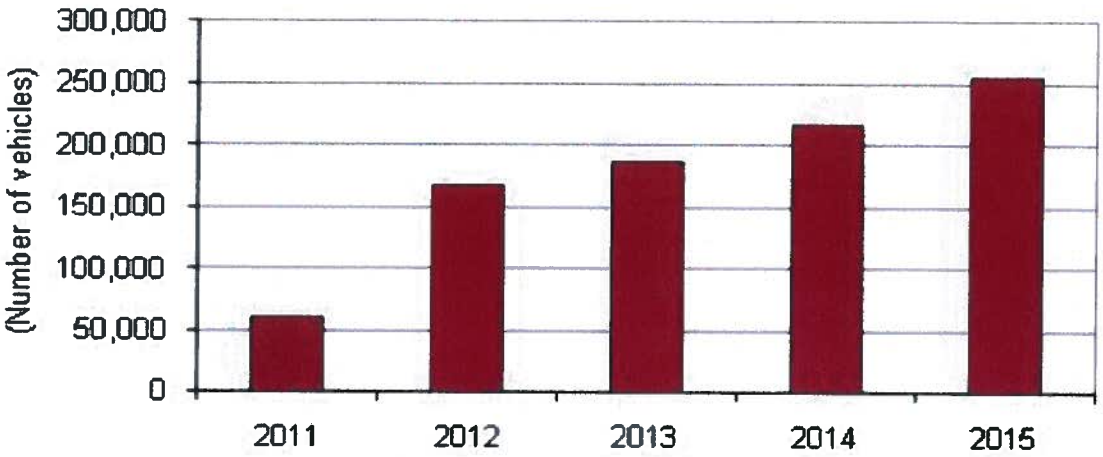
City Metro Area	Total PEVs	Load if everyone charged at the same time (MW)	Load if charging is staged over 8 hours (MW)	Load if charging is staged over 12 hours (MW)
New York	**54,069**	**299**	**33**	**22**
Los Angeles	**119,069**	**658**	**147**	**98**
Chicago	**27,892**	**154**	**34**	**23**
Washington, DC	**37,520**	**207**	**46**	**31**
San Francisco	**91,005**	**503**	**112**	**75**
Philadelphia	**18,319**	**101**	**23**	**15**
Boston	**31,976**	**177**	**40**	**26**
Detroit-Ann Arbor	**10,718**	**59**	**13**	**9**
Dallas-Fort Worth	**10,961**	**61**	**14**	**9**
Houston	**12,032**	**67**	**15**	**10**
Atlanta	8,017	44	10	7
Miami	11,346	63	14	9
Seattle-Tacoma	26,088	144	32	21
Phoenix	15,831	88	20	13
Minneapolis	10,574	58	13	9
Cleveland-Akron	8,574	47	11	7
San Diego	22,445	124	28	18
St. Louis	5,730	32	7	5
Denver-Boulder	11,230	62	14	9
Tampa-St. Pete	9,059	50	11	7

Note: Metro areas located within the ISO/RTO study are bold; other metro areas are in gray

Nationwide Forecast: IDC Energy

IDC Energy developed a U.S. PEV forecast from 2011-2020. According to the IDC Energy forecast, the U.S. market could have 885,346 PEVs by 2015 (falling short of the Obama Administration's goal of one million PEVs). **Figure 2.2** presents forecasted U.S. PEV Sales from 2011-2015 (IDC Energy, 2010).

Figure 2.2
Forecasted U.S. PEV Sales from 2011-2015 (IDC Energy, 2010)

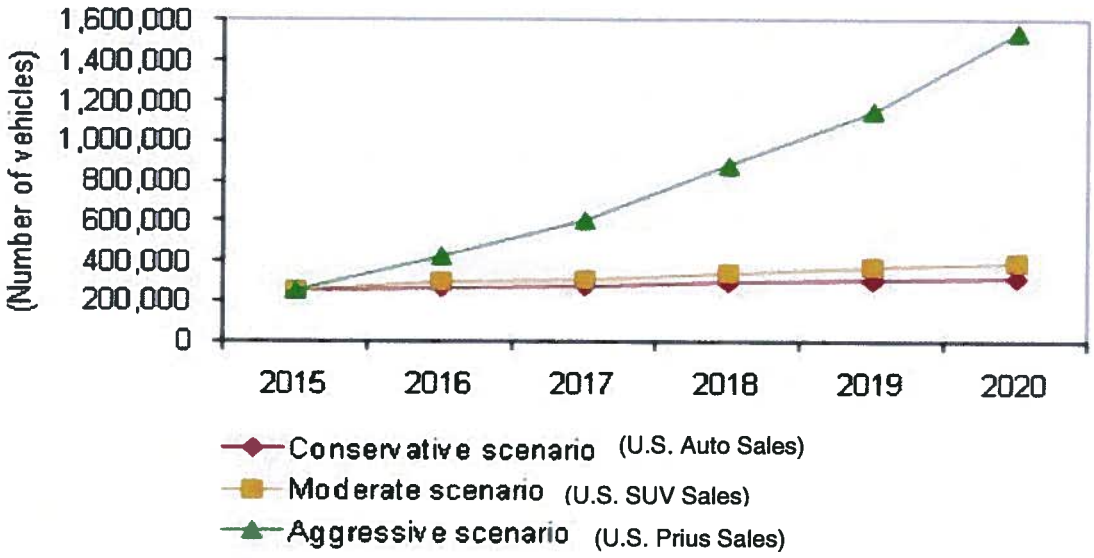


IDC Energy indicates that it is much more difficult to forecast what happens after 2015 due to PEV prices being considerably lower and mainstream consumers being the primary purchasers. IDC Energy developed a U.S. PEV forecast between 2015 and 2020 based on three scenarios:

- The "conservative" scenario follows the regular trends of car sales in the U.S. between 2002 and 2007. This was a period of steady growth in the automotive market. The conservative scenario results in a less than 1% penetration rate of PEVs by 2020.
- The "moderate" scenario follows the trend of sport utility vehicles (SUVs) during the second half of the 1990s. SUVs were very popular during that era and represented a relatively new product transitioning from an initial consumer interest phase into one of high growth. The moderate scenario also results in a 1% penetration rate of PEVs by 2020.
- The "aggressive" scenario follows the sales trend of the Toyota Prius from 2002 to 2007 (which begins five years after it was first introduced). The aggressive scenario results in a rapid adoption rate and a PEV penetration rate of almost 4% by 2020.

Figure 2.3 presents forecasted U.S. PEV Sales from 2015-2020 (IDC Energy, 2010).

Figure 2.3
Forecasted U.S. PEV Sales from 2015-2020 (IDC Energy, 2010)



Ameren Illinois Forecast

Ameren developed a PEV forecast for the Ameren Illinois service territory from 2012-2020. The Ameren Illinois PEV market projections were based on some assumed market penetration rates of PEVs and historical Prius adoption rates applicable to the Ameren Illinois service territory relative to the rest of the U.S. The forecast assumed that 15% of new car sales would be PEVs by 2015 and increase to 25% by 2025.

The Ameren service territory consists of approximately 1.8% of the nation's households. A simple view would be to assume that 0.9% of the PEVs sold would occur in the Ameren Illinois territory; however, the adoption rate of hybrid electric vehicles ("HEVs") shows that Missouri lagged the nation on adoption. It was assumed that the downstate Illinois adoption rate was similar to that of Missouri. The Ameren Illinois territory PEV forecast was based on two scenarios:

- The "follower" scenario assumes an adoption rate in the Ameren Illinois service territory equal to 66% of the national average, following historical Prius adoption rates.
- The "aggressive" scenario assumes an adoption rate in the Ameren Illinois service territory equal to 100% of the national average.

The Ameren Illinois PEV analysis forecasted an adoption rate ranging from 156,215 to 236,690 PEVs by 2020. **Table 2.3** presents the estimated range of PEVs for Ameren Illinois.

Table 2.3
Forecasted PEV Adoption Rate for Ameren Illinois

YEAR	Estimated Range of Cumulative Total PEVs
2012	4,387 - 6,647
2013	13,054 - 19,779
2014	25,974 - 39,355
2015	42,326 - 64,130
2016	61,084 - 92,552
2017	82,177 - 124,510
2018	105,758 - 160,239
2019	131,881 - 199,820
2020	156,215 - 236,690

Ameren Illinois also developed an electric load forecast for its service area for the period 2012-2020 based on the PEV adoption rates presented on **Table 2.3**. The electric load forecast made the following aggressive assumptions:

- PEV batteries have an average of 15 kilowatt hour (kWh) of capacity and require a daily recharge of 75% of that capacity.
- Charging is assumed to occur at a demand of 1.8 kW over a 6.25 hour period daily,
- All charging occurs simultaneously. [Note this is an extremely conservative assumption. In a study performed since this analysis, the Electric Power Research Institute determined that relative to the standard 3.3 kW on-board charger for passenger vehicles, the cumulative effects of different home arrival times, plug-in times, and initial battery states combine for an aggregate charging demand of only 0.8 kW per vehicle (Chartwell Webinar, 2010).]
- PEVs have an operating life of eight years.

Table 2.4 presents the forecasted load (MWh) and peak demand (Megawatt, MW) impacts from PEVs for Ameren Illinois.

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Table 2.4

Forecasted Load (MWh) and Peak Demand (MW) Impacts for Ameren Illinois

YEAR	Estimated Range of MWh Impact	Estimated Range of Peak MW Impact
2012	18,014 - 27,294	8 - 12
2013	53,603 - 81,217	23 - 36
2014	106,658 - 161,603	47 - 71
2015	173,799 - 263,332	76 - 115
2016	250,827 - 380,041	110 - 167
2017	337,438 - 511,270	148 - 224
2018	434,267 - 657,980	190 - 288
2019	541,536 - 820,509	237 - 360
2020	641,459 - 971,907	281 - 426

Summary

Many inconsistent PEV adoption rate forecasts exist. At this point, it is difficult to forecast how quickly the market will adopt PEVs. Many factors will influence PEV adoption rates, some of which include the cost of PEVs, Federal and State incentives for PEVs, battery technology, and the cost of gasoline compared to electricity. Because of the uncertainty, Ameren Illinois is working internally and with others to better understand PEVs and the impact on the system. Below is a summary of the various forecasts.

Nationwide Forecasts

- According to the KEMA analysis, the U.S. PEV market could range from 250,000 to one million PEVs by 2015.
- According to the IDC Energy forecast, the U.S. market could have 885,346 PEVs by 2015.

Ameren Service Territory Forecasts

- According to the KEMA analysis, Los Angeles ranked first out of the top 20 most populous metropolitan areas in the U.S. in terms of PEV adoption by 2015 (119,069 vehicles), while St. Louis ranked 20th (5,730 vehicles). The associated peak demand in St. Louis could range from 7 to 32 MW depending on the degree of charging diversity.
- According to the aggressive Ameren analysis, the Ameren Illinois service territory reaching a potential 42,326 to 64,130 PEVs by 2015. The energy from charging these vehicles ranges from 173,799 to 263,332 MWh, with peak demands ranging from 76 to 115 MW.

- In addition, Illinois Business Consulting (IBC, affiliated with the University of Illinois-Champaign/Urbana) is developing a forecast for the Ameren service territory. The IBC forecast will be available by the end of December 2010.

Customer Survey and Results

In July 2010, the Ameren Customer Satisfaction and Business Optimization Department conducted a telephone survey to determine the current level of PEV awareness and interest among Ameren's residential customer base. One thousand customers (500 residential customers in both Ameren Missouri and Ameren Illinois) were contacted. Based on the results of the July 2010 Residential PEV Survey, the following list identifies key observations:

- **Awareness of PEVs –** Approximately 38% of Ameren Illinois residential customers are very aware of PEVs. Respondents between the ages of 55 and 64 and 65+ have the greatest awareness. Those with incomes of $75,000 to $100,000/year and greater than $100,000/year have a higher awareness.
- **Purchase Consideration Likelihood –** Approximately 27% of residential customers are either very likely or somewhat likely to consider purchasing a PEV in Ameren Illinois' service area.
- **Items that are "Very Important" to Influence a Purchase Consideration –** Residential customers in Ameren Illinois indicated that the biggest items influencing the purchase of PEV included (1) an initial cost that was less than comparable gasoline vehicles and (2) its positive impact on the environment. These items of influence are the same for both states regardless of living in a metro or regional area. In addition, these factors were more important to the female survey population than they were to the males.

3. **An analysis of any distribution system upgrades necessary to ensure that the distribution system is able to accommodate the anticipated number of electric vehicles without disruption in service for any customer;**

Distribution Impacts

The impact that PEV charging load will have on the electric system depends on many variables such as the total number of vehicles and their locations on the system, charging levels (120 VAC vs. 240 VAC or higher), the sizes of the vehicle's chargers, charging frequencies, charging times of day, and initial battery states. The addition of PEV charging load could advance the need for system upgrades, particularly in areas where facilities are already heavily loaded or constrained. The most likely impact will be at the lower voltage distribution system level in areas of high penetration or where "clusters" of charging stations exist. "Clustering" occurs when a concentrated number of charging stations are installed in one area (e.g., an apartment building, a neighborhood, a parking garage, or place of business). PEV "clusters" are more likely to require local system upgrades (e.g., services,

secondary spans, or distribution transformers) to avoid equipment overloads and/or low end-use voltages.

An analysis was conducted to determine the electric system impact of PEVs on the Ameren Illinois service territory. Based on Ameren's analysis projected PEV penetrations in the Ameren Illinois service territory as discussed in the response to Item #2 above, the estimated additional peak loading at the distribution substation level over the next ten years is 4.6% to 6.9%. This is based on two aggressive assumptions – all vehicle charging overlaps during on-peak hours (10 AM to 10 PM) with an average coincident charging demand of 1.8 kW per PEV. On this basis, it is likely that Ameren Illinois will have enough capacity to meet the load requirements for PEVs in the near-term. In isolated cases, Ameren Illinois may need to upgrade the distribution system (e.g. in 4 kV distribution areas) due to the "clustering" phenomenon.

The system impacts can be minimized for the foreseeable future to the extent that PEV charging can be shifted to off-peak hours. The system could potentially handle charging up to a hundred thousand PEVs or more during off-peak periods without requiring significant system upgrades at the distribution substation level or above. It is generally acknowledged in the industry that the increased off-peak load could diminish the transformer and circuit reserve capacity available on the system, reducing the options for transferring load to restore power during outage events or to perform system maintenance. Of particular concern are the potential restrictions on distribution transformer ratings given the reductions in the cooling cycles of these units during off-peak hours.

In order to minimize and better predict the electric system impacts of PEV charging loads, a process for providing the utility with a notification that a customer has purchased a PEV would be helpful. Such a notification will prompt utility review of the customer's service capacity for possible upgrade, in the interest of ensuring both the operating integrity of the distribution system and a positive PEV purchase experience for the customer.

4. **An analysis and assessment of dynamic, real-time or time-of-use pricing to enable the use of plug-in electric drive vehicles to contribute to meeting peak-load demand reduction, ancillary service power needs, energy efficiency and/or other programs to minimize the need for existing infrastructure upgrades;**

PEV Rate Design Concepts

All other variables constant, PEV's will increase energy use. However, time variant pricing can help determine when that load is served. In competitively served electric supply markets, off-peak prices are usually lower than on-peak prices. Financially motivated customers will likely respond to electricity prices and charge their vehicles during off-peak hours if rates are designed to provide this benefit. Off-peak charging will help limit contributions to peak load, and will tend to correspond with customers' busy schedules.

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Time variant rates are likely to provide the greatest benefit to customers and the utility. Rates, like many other unregulated services, also undergo a degree of public acceptance. For example, while time of use (TOU) rates encourage more efficient use of the electricity system, residential customers have been slow to adopt them over the fixed ¢/kWh rates common for the group. Customers may perceive a small benefit under TOU, but find such benefits do not outweigh the convenience of the standard rate. These challenges and perceptions will likely carry forward for the near term as the PEV market begins to emerge. Nevertheless, through customer education and demonstration of benefits to both the utility and customer, acceptance of time-differentiated rates could grow.

Ameren Illinois believes that directing customers toward real-time pricing programs will achieve the goal of encouraging customers to charge PEVs during off-peak hours. However, Ameren Illinois faces two immediate challenges that will impact the ability to encourage customers to adopt the rate. First, existing fixed supply prices are too low for a segment of residential customers (those who heat their homes using electricity) to benefit financially from RTP. Second, Integrated Distribution Company ("IDC") rules prohibit marketing of utility provided supply options. Both issues are discussed in more detail below.

Regarding the challenges presented by deeply discounted electric heat rates, the Ameren Illinois service area faces some unique pricing challenges that could slow the adoption of RTP by this segment of the residential market. In late 2007, basic generation service ("BGS") was restructured to provide relief to residential customers that had favorable electric space-heating pricing available under legacy (pre-2007) rates. Former AmerenCIPS (Rate Zone I) and AmerenIP (Rate Zone III) premises subject to the space-heat provisions of legacy tariffs, and all AmerenCIPS-ME (subset of Rate Zone I) and AmerenCILCO (Rate Zone II) premises, were provided lower BGS rates for use over 800 kWh in a non-summer billing period. **Table 4.1** shows the current marginal BGS rates for the various Ameren Illinois Rate Zones.

Table 4.1
BGS-1 Residential Power Prices

	Rate Zone I	Rate Zone II	Rate Zone III
Summer - All kWh	$0.04945	$0.04919	$0.04911
Non-Summer, First 800 kWh	$0.05936	$0.05900	$0.05619
Non-Summer, +800 kWh, Non-heat 1/	$0.05936	NA	$0.05619
Non-Summer, +800 kWh, Space-heat 1/	**$0.03366**	NA	**$0.01844**
Non-Summer, +800 kWh, All other 2/	**$0.01984**	**$0.03775**	NA

1/ Space-heat rate available to Rate Zone I and Rate Zone III customers that previously took service under special space-heat end use rates or provisions available prior to January 2, 2007.
2/ Applicable to all Rate Zone I customers formerly served under tariffs applicable to the Metro-East service territory, and applicable to all Rate Zone II customers.

Except for Rate Zone I and Rate Zone III non-space heat customers (where the non-summer power price is a flat rate of just below 6¢/kWh), the marginal non-summer price is likely too low to entice customers that heat their homes with electricity to adopt real-time pricing. Customers in the former Metro-East area of Rate Zone I, and space-heat premises in Rate Zone III face a marginal non-summer price of just under 2 ¢/kWh. Customers in Rate Zone II and former space-heat customers in Rate Zone I face a marginal rate of about 3.8¢/kWh and 3.4¢/kWh, respectively. In contrast, the average non-summer hourly price was about 3.6 ¢/kWh over the past 12 months, where the 12 hour on-peak period (10 AM – 10 PM, excluding weekends and holidays) averaged about 4.4 ¢/kWh and the off-peak period averaged about 3.1¢/kWh. Details by month are shown in **Table 4.2**.

Table 4.2

Average of Day-Ahead Hourly Prices-Ameren Illinois Load Zone

		Peak		
Year	Month	off	on	Grand Total
2009	12	3.04	3.98	3.45
2010	1	3.81	4.84	4.24
	2	3.66	4.41	3.98
	3	2.93	3.49	3.17
	4	2.62	3.46	2.97
	5	2.77	4.23	3.26
	6	3.37	5.72	4.23
	7	3.61	6.31	4.52
	8	3.31	6.02	4.31
	9	2.46	3.90	2.96
	10	2.49	3.34	2.78
	11	2.62	3.12	2.80
Total		3.06	4.40	3.56

On-peak period is 10 AM - 10 PM, excluding weekends and holidays
Prices include Ancillary Service Energy, Renewable Energy Compliance, and Market Settlement Costs of 0.1001 ¢/kWh for each hour.
LMP values also adjusted for average line losses of 7%.

It is estimated that approximately 15% of Ameren Illinois residential premises use electricity to heat their homes. Favorable non-summer fixed prices (those in bold in **Table 4.1**) apply to about 2 billion kWh of load today, or roughly 17% of annual residential sales. If these customers purchase a PEV, it will be difficult to entice them to choose a RTP service due to the inherent financial disincentive. Ameren Illinois, with the Commission's support, will continue to propose modifications to the non-space heat marginal BGS prices to become more competitive with RTP. Conversely, a comparison of **Table 4.1** and **Table 4.2** confirms

that non-space heat customers purchasing a PEV indeed should financially benefit by charging during off-peak periods if they choose a TOU or RTP option.

Further segmenting the off-peak window to a "super off-peak" from 12 AM up to 5 AM shows customers could achieve even more favorable electricity pricing in those hours. **Table 4.3** shows a comparison of average hourly prices over the past 12 months in the super off-peak period, a super on-peak period (1 PM up to 6 PM), and all other hours.

Table 4.3
Average of Day-Ahead Hourly Prices
Ameren Illinois Load Zone
(Cents/kWh)

		Time of Use Period			
Year	Month	Super-Off	Super-On	All other	Average
2009	12	2.30	3.86	3.72	3.45
2010	1	2.89	4.51	4.63	4.24
	2	2.87	3.92	4.41	3.98
	3	2.34	3.10	3.50	3.17
	4	1.95	3.30	3.22	2.97
	5	2.05	4.28	3.34	3.26
	6	2.22	6.58	4.12	4.23
	7	2.31	7.65	4.33	4.52
	8	2.33	7.12	4.15	4.31
	9	1.54	4.05	3.08	2.96
	10	1.82	3.08	3.01	2.78
	11	2.07	3.13	2.95	2.80
Total		2.22	4.55	3.70	3.56

Super-Off peak period is 5 hour period starting at 12 AM up to 5 AM.
Super-On peak period is 5 hour period starting at 1 PM up to 6 PM.
All Other includes hours not in the Super-on or Super-Off peak periods (starting 5 AM up to 1PM, 6 PM up to 12 AM)
Prices include Ancillary Service Energy, Renewable Energy Compliance, and Market Settlement Costs of 0.1001 ¢/kWh for each hour.
Super-On peak prices include average price for capacity assuming 3.3 kW peak (possible demand with Level 2 charger).
LMP values also adjusted for average line losses of 7%.

A customer that would otherwise drive a conventional vehicle about 600 miles per month would spend about $800 per year on gasoline assuming the vehicle achieves about 27.5 miles per gallon and gasoline is priced at $3.00/gallon. An electric vehicle, in contrast would use about 3,000 kWh to travel the same distance. Using an additional 3,000 kWh would add approximately the following amounts to an electric customer's bill (**Table 4.4**):

Table 4.4
Incremental Cost of Electricity Under Various Rate Options

	Delivery Service Plus:		
Rate Zone and Customer Profile	BGS	RTP Super-off	RTP Super-on
Rate Zone I Non-heat	$143.45	$66.34	$94.27
Rate Zone I Space-heat	$85.38	$59.67	$87.60
Rate Zone I - ME (non-heat profile)	$93.22	$66.34	$94.27
Rate Zone I - ME (heat profile)	$57.74	$59.67	$87.60
Rate Zone II (non-heat profile)	$115.91	$66.75	$94.68
Rate Zone II (heat profile)	$94.18	$60.51	$88.44
Rate Zone III - Non-heat	$158.18	$87.29	$115.22
Rate Zone III - Space-heat	$77.42	$82.03	$109.96

Assumes incremental 3,000 kWh per year, or 250 kWh per month to base use. Non-heat customer base use is 10,000 kWh per year, and space-heat customer base use is 18,000 kWh per year.

As shown, standard fixed price Basic Generation Service (BGS) plus Delivery Service charges would add amounts ranging from about $158 to a Rate Zone III (former AmerenIP) non-heat customer's bill to about $58 for Rate Zone I-ME (former AmerenCIPS Metro-East) customer using electricity to heat their residence. In all cases except for Rate Zone I-ME and Rate Zone III space-heat, customers could financially benefit by taking service under the RTP option if they charge vehicles during the super off-peak period of 12 AM up to 5 AM.

Future energy prices will change, and the values above with it. Even at standard fixed prices, using electricity to displace gasoline appears to have significant value. If customers shift PEV charging to off-peak times, even greater value could be attained.

Regarding the second challenge, as an IDC, the promotion, marketing, or advertising with regard to the provision of electric supply service is prohibited. Directly marketing or promoting RTP service to PEV customers may require a waiver from the ICC. Also, Ameren Illinois is committed to facilitating customer power supply choice in its service area. Retail

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Electric Suppliers ("RES") may choose to also offer time variant power prices to customers. Ameren Illinois encourages customers to explore all rate options. In any event, both the Ameren Illinois and RES time variant options would currently require use of an interval meter.

5. **An analysis of any other equipment and technology, other than rates, that may encourage owners of electric vehicles to charge in a manner that avoids detrimental impacts on the distribution system, transmission system and bulk power system and assists in the integration of renewable resources;**

Controlled Charging (G2V) and Discharging (V2G)

Any equipment or technology that automates vehicle charging will make it easier for customers to charge in a manner that avoids detrimental system impacts, and therefore may encourage customers to charge appropriately. Most PEV's will be equipped with built in charging timers that will prompt drivers when they expect to depart for their next trip. The on-board computer will calculate the time required to charge the battery, and will favor off-peak times. The on-board computer may also integrate utility rates to also find the most financially advantageous time for the PEV owner to charge their vehicle.

Controlled charging [i.e. Grid-to-Vehicle (G2V)] generally refers to the pursuit of moving PEV charging times to off-peak hours when possible and practical. This is motivated by the utility's desire to minimize the impact of large vehicle penetrations on the distribution system by leveraging off-peak infrastructure capacity. This effort could be as simple as using timers; however it is likely that charge controllers will involve some kind of communication with the utility provider, inferring the utility will have a stake in how such charging is conducted. This is also referred to as "smart charging," and it implies only one direction of power flow, from the power G2V.

Electric-drive vehicles, whether powered by batteries, fuel cells, or gasoline hybrids, also have the potential to produce the same 60-cycle electricity that powers our homes and offices. Controlled discharging [i.e. Vehicle-to-Grid (V2G)] refers to the possibility that electricity flow is also permitted in the non-conventional second direction, from the vehicle to the power grid. The motivation driving V2G can be either the utility's (i.e. in a demand response setting) or the customer's (i.e. in a power marketing setting). V2G may also assist with the integration of renewable resources. There are many technical, marketing and sociological considerations that need vetting before V2G would ever become predominant in the industry.

There are several methods that can be used to automate the charging / discharging process. The simplest involve timers either in the vehicle or in the charging station that can be programmed to charge at only certain times of day. More complicated schemes involve remote control of the vehicle or charging station (via various communication methods

including cell networks, the internet, or utility AMI systems). Charging control signals can be sent by the customer, the utility, RES, or other third party based on various criteria (electricity cost, system demand, customer preferences, etc.). Utility or third party control would require customer consent and likely a tariff or agreement governing terms and conditions.

6. **An analysis of the need for separate metering to track usage of electric vehicles;**

Separate Metering

Ameren Illinois recommends that separate metering initially be avoided where practical. PEV load could be treated as other significant loads (e.g., air conditioning, water heating, space-heating). Customers who install charging stations in their home or business may do so behind existing metering. A utility installed sub-meter for PEV load would add cost to the utility, and ultimately the customer. Customers who choose to charge electric vehicles at the premise should be encouraged to adopt time variant pricing. Customers not already served under a time variant priced tariff may require a meter change-out.

Ameren Illinois will continue to evaluate in-home charging stations and the ability to receive and use "billing quality" usage information from those stations. Emerging technology may permit cost effective means to capture PEV only loads, which will in turn permit separate pricing for PEV usage without the need to install a separate meter.

7. **An assessment of public and private electric charging infrastructure necessary to support deployment of electric and hybrid electric vehicles;**

Charging Infrastructure

It is likely that PEVs will be charged in residential, workplace, and public locations (e.g. hospitals, shopping malls, universities, interstate rest areas, train stations, etc.). EPRI predicts approximately 80% of charging will occur in residential areas (single or multi-family homes), approximately 15% of charging will occur at the workplace, and approximately 5% will occur at public charging stations (EPRI, 2010). Several issues exist regarding charging infrastructure, including range anxiety, infrastructure development, and metering and billing options.

Range Anxiety

Range anxiety is the fear that an EV will run out of battery power and leave its driver stranded. Although the majority of PEV charging will occur in residential areas, other charging stations will need to be installed to overcome range anxiety issues. Installation of Level 2 and Level 3 charging stations in public areas are anticipated to relieve range anxiety pressures and promote adoption of PEVs.

Tokyo Electric Power Company (TEPCO) evaluated the impact of a public charging station on the consumers' driving range between 2007 and 2008. In 2007, TEPCO educated the customers regarding the EV driving range performance and drivers understood that they could cover a certain range with a full charge. However, TEPCO noticed that drivers were only willing to travel a short distance initially. In 2008, TEPCO installed a quick charging station, after which the EV drivers significantly increased their mileage (PGE, 2010). **Figures 7.1 and 7.2** show the driving ranges before and after the installation of a quick charging station, respectively.

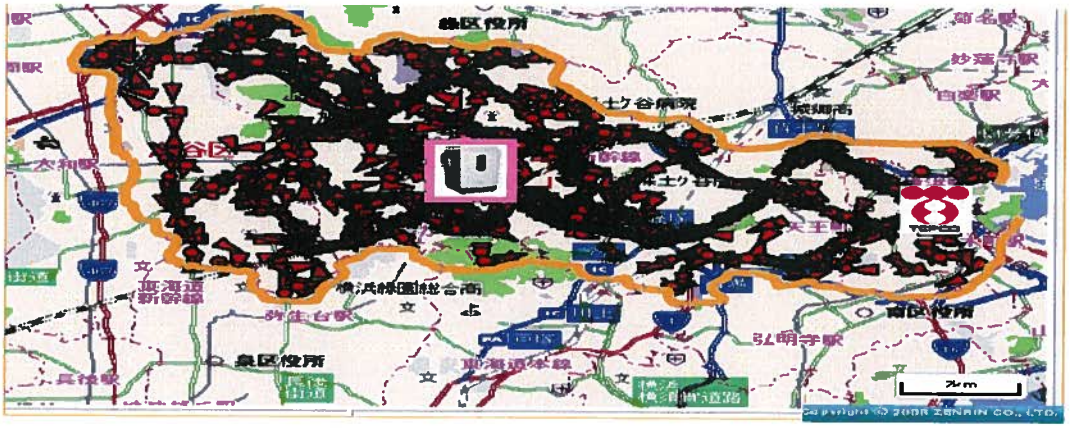
Figure 7.1

Driving Range before the Quick Charger Installation (PGE, 2010)

**LEGEND: Orange Line-Boundary of Study. Red Arrows-Driving Pattern.

Figure 7.2

Driving Range after the Quick Charger Installation (PGE, 2010)



**LEGEND: Orange Line-Boundary of Study. Red Arrows-Driving Pattern.

Infrastructure Development

Consumers of PEVs are ultimately responsible for the cost of getting their homes ready. Consumers can work through auto dealerships, charging station manufacturers, or local

contractors to have certified personnel install electric vehicle supply equipment (EVSE) in their homes.

Building a public charging system outside of the residential arena is an entirely different matter and can require a large outlay of capital. Further complicating the issue today are open questions as to how much charging infrastructure is required for a given area's PEV penetration, where charging stations should be located relative to area driving patterns, who should own and maintain them, and how the public charging "service" should be billed to consumers, if at all. There is no one party generally considered "responsible" for developing and building out public charging infrastructure to support PEVs. In communities where public charging infrastructure is being developed, local governments (municipalities), businesses and utilities have partnered with each other to varying degrees to take on this responsibility.

PEV manufacturers have indicated that the demonstrated support of charging infrastructure development by the local utility is vital to their consideration of any area as a "launch market" for their product. Such utility support does not necessarily take the form of building infrastructure outright; it can also take the form of customer education, employee incentives, partnering with corporate "neighbors," communicating with building code authorities in support of charging infrastructure growth, and working with local inspection authorities to ensure a smooth permit process for home charging station installations.

Metering and Billing Options

Currently, a national standard does not exist regarding metering and billing options for charging stations, and many states are developing their own structures. There are various residential rates options possible, and ultimately the residential customer will pay for the energy usage at their homes. However, there are several concerns regarding who pays for the electricity usage at the workplace and for public charging stations. Ameren Illinois views public charging as a competitive transaction between the provider and the customer, similar to how a customer may purchase gasoline today.

8. A description of any regulatory barriers that might create unnecessary delay for consumers for installation of at-home charging infrastructure;

Regulatory Barriers

Ameren Illinois believes installation of at-home charging infrastructure represents an activity not unlike installation of a new air conditioning unit. Customers should be free to choose the vendor and equipment that best suits their needs, and installation should follow all local building codes. Ameren Illinois will encourage customers to voluntarily provide notification of a Level 2 (240 volt 40 amp branch circuit) charging station installation to ensure reliability for the customer. A model where mandatory notification is provided through the Secretary of State (for example) after a purchase could help facilitate distribution system reliability, but

such a model may be viewed as intrusive by customers (or potential customers) and should be weighed against hindering development of the PEV market.

9. A description of the utility's system-wide fuel profile, including the proportion of electricity generated or purchased from coal, natural gas, and renewable sources during peak and off peak periods and by season;

MISO Generation Profile

Ameren Illinois is supplied by the Midwest Independent Transmission System Operator (MISO) market, thus it is appropriate to use the MISO fuel mix to describe the generation sources used to supply the Ameren Illinois customers. The generation data was obtained from MISO in December 2010 and is a percentage of the total megawatt hours (MWH) produced.

The MISO generation data was evaluated seasonally during on-peak and off-peak periods from January–November 2010. (Definitions: On-Peak---Period of time between Hour-ending 0700 EST through and including Hour-ending 2200 Hours EST Monday through Friday excepting New Year's, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, and Christmas Day or if the holiday occurs on a Sunday, the Monday immediately following the holiday. Off-Peak---All periods not classified as On-Peak). The average shown is an arithmetic average of the month included in the season [i.e., winter (January-March 2010), spring (April-June 2010), summer (July-September 2010), and fall (October-November 2010)]. **Tables 9.1 and 9.2** present the on-peak and off-peak MISO generation data, respectively.

Table 9.1

Ameren Illinois On-Peak Purchases from MISO Market (January-November 2010)

Season	Month-Year	Coal	Gas	Hydro	Nuclear	Oil	Pet Coke	Wind	Waste	Other
WINTER	Jan-10	79.37%	1.46%	1.12%	13.92%	0.29%	0.21%	3.33%	0.12%	0.18%
	Feb-10	78.94%	1.14%	1.17%	14.93%	0.26%	0.25%	2.96%	0.16%	0.18%
	Mar-10	78.15%	1.02%	1.27%	14.51%	0.14%	0.20%	3.99%	0.21%	0.51%
	Average	**78.82%**	**1.21%**	**1.19%**	**14.45%**	**0.23%**	**0.22%**	**3.43%**	**0.16%**	**0.29%**
SPRING	Apr-10	76.60%	1.64%	1.39%	14.28%	0.23%	0.25%	4.86%	0.22%	0.52%
	May-10	78.86%	3.02%	1.28%	11.62%	0.65%	0.28%	3.84%	0.21%	0.23%
	Jun-10	76.05%	7.64%	1.94%	10.95%	0.55%	0.24%	2.39%	0.19%	0.06%
	Average	**77.17%**	**4.10%**	**1.54%**	**12.28%**	**0.48%**	**0.26%**	**3.70%**	**0.21%**	**0.27%**
SUMMER	Jul-10	70.69%	12.39%	1.75%	11.97%	1.21%	0.22%	1.57%	0.16%	0.05%
	Aug-10	71.03%	11.67%	1.55%	12.06%	1.39%	0.20%	1.89%	0.16%	0.05%
	Sep-10	74.11%	4.80%	1.38%	15.13%	0.45%	0.24%	3.63%	0.19%	0.07%
	Average	**71.94%**	**9.62%**	**1.56%**	**13.05%**	**1.02%**	**0.22%**	**2.36%**	**0.17%**	**0.06%**
FALL	Oct-10	73.26%	4.67%	1.76%	14.82%	0.48%	0.26%	4.44%	0.22%	0.09%
	Nov-10	75.40%	4.24%	1.93%	12.94%	0.37%	0.26%	4.58%	0.20%	0.08%
	Average	**74.33%**	**4.46%**	**1.85%**	**13.88%**	**0.43%**	**0.26%**	**4.51%**	**0.21%**	**0.09%**

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Table 9.2

Ameren Illinois OFF-Peak Purchases from MISO Market (January-November 2010)

Season	Month-Year	Coal	Gas	Hydro	Nuclear	Oil	Pet Coke	Wind	Waste	Other
WINTER	Jan-10	79.40%	1.02%	-0.59%	15.59%	0.11%	0.22%	3.78%	0.14%	0.33%
	Feb-10	79.85%	0.76%	-0.78%	16.38%	0.07%	0.25%	3.03%	0.18%	0.26%
	Mar-10	77.86%	0.73%	-0.53%	16.39%	0.06%	0.18%	4.71%	0.25%	0.34%
	Average	**79.03%**	**0.84%**	**-0.64%**	**16.12%**	**0.08%**	**0.22%**	**3.84%**	**0.19%**	**0.31%**
SPRING	Apr-10	76.51%	0.66%	-0.92%	17.17%	0.03%	0.29%	5.66%	0.27%	0.32%
	May-10	79.90%	1.45%	-0.69%	13.90%	0.07%	0.31%	4.69%	0.26%	0.11%
	Jun-10	80.34%	3.69%	-0.48%	12.97%	0.13%	0.26%	2.79%	0.24%	0.07%
	Average	**78.91%**	**1.93%**	**-0.70%**	**14.68%**	**0.08%**	**0.29%**	**4.38%**	**0.26%**	**0.17%**
SUMMER	Jul-10	76.52%	5.67%	-0.27%	14.91%	0.27%	0.25%	2.39%	0.21%	0.06%
	Aug-10	76.31%	5.16%	-0.43%	15.00%	0.34%	0.23%	3.12%	0.21%	0.06%
	Sep-10	73.22%	1.59%	0.85%	19.31%	0.06%	0.30%	4.33%	0.25%	0.08%
	Average	**75.35%**	**4.14%**	**0.05%**	**16.41%**	**0.22%**	**0.26%**	**3.28%**	**0.22%**	**0.07%**
FALL	Oct-10	73.65%	2.47%	0.34%	17.98%	0.13%	0.31%	4.76%	0.28%	0.10%
	Nov-10	75.77%	2.07%	-0.04%	15.16%	0.04%	0.29%	6.37%	0.25%	0.09%
	Average	**74.71%**	**2.27%**	**0.15%**	**16.57%**	**0.09%**	**0.30%**	**5.57%**	**0.26%**	**0.09%**

Note: 1. During off-peak hours, net hydro generation can be negative due to the contribution of pump storage units.

10. A discussion of how the utility plans to comply with any regulations that may be issued by the Federal Energy Regulatory Commission pursuant to Section 1305(d) of the Energy Independence and Security Act of 2007, to the extent such regulations are known, concerning the protocols and standards for integrating plug-in electric vehicles into an electrical distribution system, including Smart Grid systems and devices as described in Title XIII of the Energy Independence and Security Act of 2007, in 2011 and thereafter; and,

Potential Future PEV Protocols and Standards

Ameren Illinois is actively following the work of the National Institute of Standards and Technology's (NIST) Smart Grid Interoperability Panel (SGIP) which is developing interoperability standards for the Federal Energy Regulatory Commission (FERC) to consider. The SGIP effort includes standards development in 17 Priority Action Plans (PAPs). One of the PAPs, PAP 11 ("Interoperability Standards to Support Plug-in Electric Vehicles"), is focused on "Common Object Models for Electric Transportation." This PAP is creating the "dictionary" of information to be exchanged to coordinate the charging of Plug-in-Electric Vehicles and to harmonize connector specifications. The completion of this standard is not expected until September 2011. Ameren Illinois will incorporate, as applicable and practical, any FERC adopted or otherwise applicable electric transportation standard into any electric transportation technology deployment it undertakes. Until such standards are available, Ameren Illinois will work with vendors to ensure any deployed

electric transportation technology is following all applicable standards in place at the time, and is upgradable as further standards are developed.

11. A summary of organizations consulted on the development of each plan, including appropriate environmental, civic and consumer organizations, as well as any existing organizations within each utility's service territory that advocate for or represent an interest in electric vehicles.

Ameren's PEV Activities

In March 2010, Ameren created a team to explore the potential impacts and opportunities that the development of the PEV industry may introduce to our business and customers. The PEV Team includes subject matter experts from Ameren Illinois, Ameren Missouri, Ameren Services, and Ameren Energy Fuels & Services. The PEV Team has researched a variety of issues, such as penetration rates of PEVs in Ameren's service territory, the impacts on our distribution system, and potential rate structures that would encourage off-peak charging of vehicles. In addition, the PEV Team evaluated the appropriate level of engagement for the corporation to ensure consistency with the corporate vision, goals and values for our stakeholders (i.e., customers, shareholders, operations, employees and communities).

In addition, Ameren is working with two research organizations to learn more about the potential for PEVs.

1. **Electric Power Research Institute (EPRI):** Ameren is working with EPRI regarding PEVs. EPRI has several programs and demonstration projects that Ameren is either actively following or participating in directly. Specifically, Ameren is involved in the following projects: EPRI Program 18A-PHEV Development, EPRI/GM Smart Charging Demonstration project, and the EPRI Plug-In Hybrid medium-Duty Fleet Demonstration and Evaluation Program. As part of these projects, Ameren Illinois intends to take receipt of four plug-in hybrid electric bucket trucks and one Chevy Volt in mid 2011. These vehicles will become part of the Ameren Illinois fleet, and Ameren Illinois will evaluate their performance as well as the affect their charging has on the Ameren Illinois distribution system. In addition, Ameren Illinois will be installing and evaluating the performance and features of several charging stations from different manufacturers.

2. **Illinois Business Consulting (IBC**, affiliated with the University of Illinois-Champaign/Urbana)**:** Ameren is working with the IBC to develop a forecast of penetration rates of PEVs in Ameren's service territory. The forecast will include demographics of customers most likely to adopt PEVs early as well as communities in which Ameren could expect such adoption to occur. In addition, Ameren hopes to gain an understanding of factors that will influence the decisions made by customers to buy PEVs (e.g., vehicle cost, different electricity rate structures offered, availability of charging stations, etc...).

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PEV Advocates in Ameren's Service Territory

Several environmental, civic and consumer organizations within Ameren's service territory advocate for or represent an interest in PEVs. Below is an initial list, though not comprehensive, of PEV advocates:

- **Electric Vehicle Manufacturers** – Ameren participated in discussions with several plug-in electric vehicle manufacturers (i.e., Nissan, Chevrolet, Smith, Eaton, and Mitsubishi) to obtain information on their offerings and commercial availability in the Ameren service territory. Many of these discussions are driven by Ameren's intended participation in EPRI's demonstration projects.

- **Charging Station Vendors** – Ameren participated in discussions with several charging station vendors (i.e., Clipper Creek, Coulomb Technologies, GE/Plug Smart, Leviton Manufacturing, and ECOtality) to obtain information on their offerings and commercial availability in the Ameren service territory. The charging station manufactures have partnerships with local distributors and local electrical contractors for purposes of ordering and providing installation in the Ameren service territory.

- **Normal, Illinois** – The Town of Normal received a $488,500 Energy Efficiency and Conservation Block Grant that was part of the 2009 federal stimulus package. The Town plans on using a portion of these funds on charging station deployment throughout the community. Normal expects to install multiple Level 1 (120 VAC) charging stations on the street in it Central Business District as well as several Level 2 (240 VAC) charging stations in parking decks and other public locations. The Town is preparing a community initiative that will focus on consumer education, charging stations deployment, and development of electric vehicle related local incentives. Through this developing initiative, Normal hopes to become a model electric vehicle community.

- **Lewis & Clark Community College (Godfrey, IL)** – Lewis & Clark is doing its part by developing a number of green initiatives and educating both campus and community about sustainability solutions. They are planning to install two charging stations on campus in 2011 in addition to converting two conventional vehicles to electric. Finally, Lewis & Clark and other regional community colleges are developing curricula for future electric vehicle mechanics around the maintenance and repair of these types of vehicles.

- **St. Louis Clean Cities' Plug-In Readiness Task Force** – St. Louis Clean Cities is a voluntary initiative sponsored by the United States Department of Energy (USDOE) to expand the commercial use of vehicles that operate with fuels other than gasoline and diesel. An EV Task Force (including MO and southern IL) has been formed with the purpose of getting St. Louis businesses, educational institutions, and governments

ready for plug-in hybrid vehicles and establishing electric charging stations around the metropolitan area. Members include: Regional Chamber & Growth Association, East-West Gateway Council of Governments, Ameren, the State of Missouri, the Gateway Electric Vehicle Club, Microgrid Energy, St. Louis Community College, and Lewis & Clark Community College.

- **Gateway Electric Vehicle Club** – The Gateway EV Club is a registered chapter of the Electric Auto Association (EAA) made up of individuals living in the Saint Louis area that believe EVs are an important part of the solution to our global energy crisis . The main goal of the group is to raise awareness around the benefits of EVs. The Gateway EV Club does this by attending community events, converting and helping others convert their cars into EVs, conducting EV club meetings, and providing EV information to interested parties.

- **AT&T** – AT&T Fleet operations are based in St. Louis. AT&T purchased two of the first all-electric versions of the 2010 Ford Transit Connect vans. In addition, Smith Electric delivered an all-electric Smith Newton cargo truck to AT&T (St. Louis Business Journal, 2010). Up until recently, AT&T's alternative fuel focus had been solely on compressed natural gas vehicles.

- **Enterprise Holdings Inc. (headquartered in St. Louis, MO)** – Enterprise Rent-A-Car announced that it is buying 500 Nissan LEAFs beginning in January 2011. Enterprise will put the vehicles in its rental fleets in eight cities: Seattle, Portland, Oregon, Los Angeles, San Diego, Phoenix, Tucson, Arizona, and Nashville and Knoxville, Tennessee. It will also add vehicle charging stations to some of its locations in 30 U.S. cities and pledged to buy PEVs from other manufacturers as they become available (WSJ, 2010b).

Ameren ILLINOIS

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